ADOT
Air Quality Management Guidebook

Webinar 2

June 26, 2013

Introductions

Who's Here?

- ADOT
- Baker
- Others?

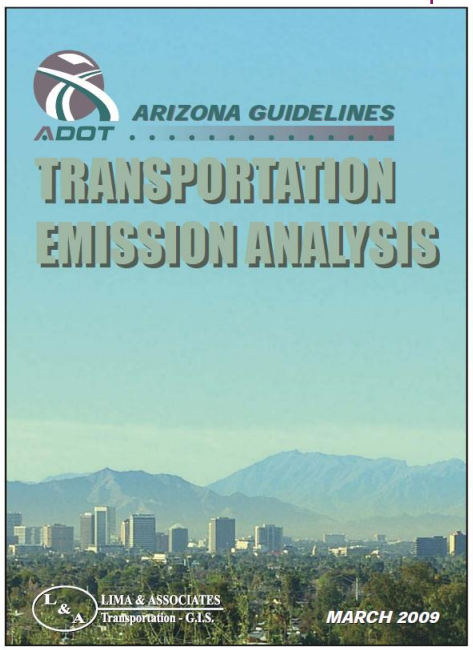
Presentation Outline

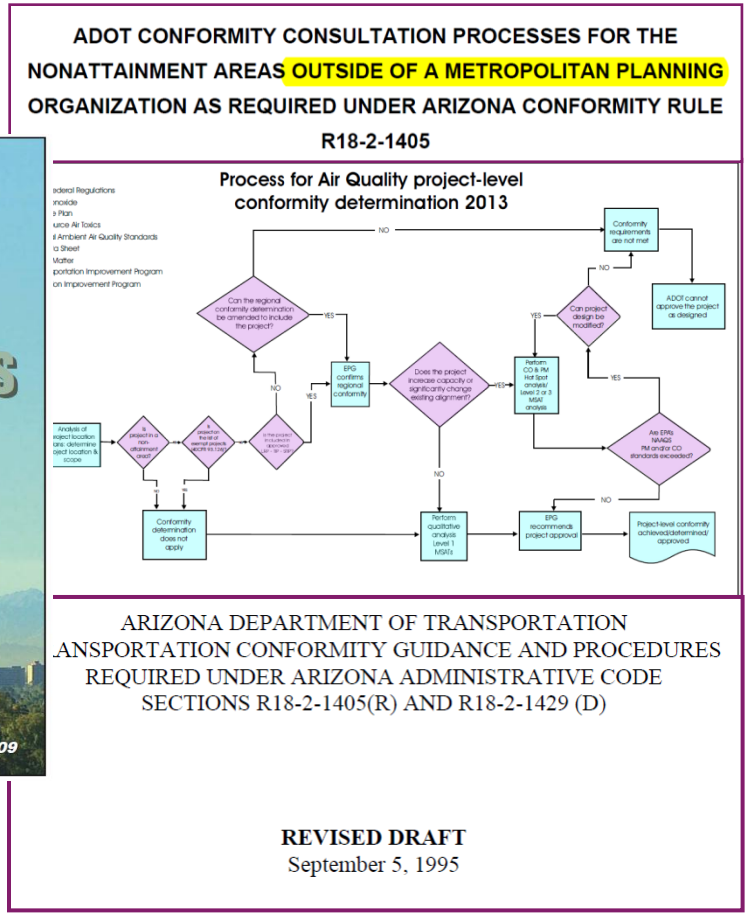
- Arizona Department of Transportation (ADOT)
  Air Quality Management Guidebook & Case Study
- Overview of Air Quality Requirements in Arizona
- Interagency Consultation
- Conformity Procedures
- Development of Mitigations Measures & TCMs
- Feedback

ADOT

Air Quality Management Guidebook & Case Study

- Purpose & Goals
- Contents
- Deliverables to date
  - WP-1
  - WP-3
  - IWP-2
  - WP-4
  - Webinar 1




ADOT CONFORMITY CONSULTATION PROCESSES FOR THE NONATTAINMENT AREAS OUTSIDE OF A METROPOLITAN PLANNING ORGANIZATION AS REQUIRED UNDER ARIZONA CONFORMITY RULE R18-2-1405

Process for Air Quality project-level conformity determination 2013

ARIZONA DEPARTMENT OF TRANSPORTATION
ANSPORTATION CONFORMITY GUIDANCE AND PROCEDURES
REQUIRED UNDER ARIZONA ADMINISTRATIVE CODE
SECTIONS R18-2-1405(R) AND R18-2-1429 (D)

REVISED DRAFT
September 5, 1995

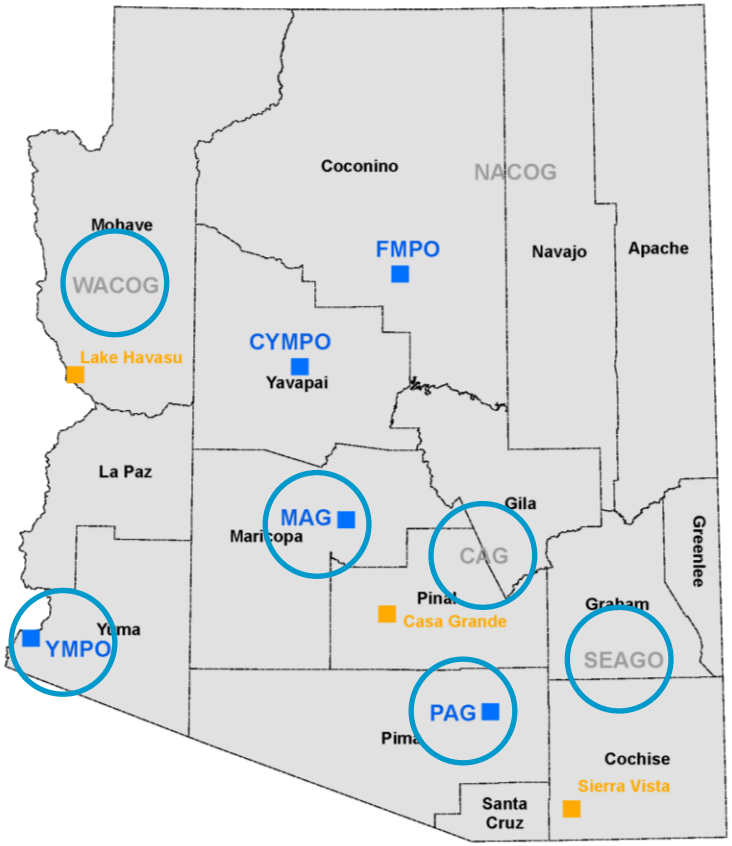
ADOT
Air Quality Management Guidebook

Air Quality Overview

Goal: Summarize Arizona AQ Status & Requirements

Air Quality Overview

Arizona Air Quality Geography



Arizona Metropolitan Planning Organizations

- Central Yavapai Metropolitan Planning Organization (CYMPO)
- Flagstaff Metropolitan Planning Organization (FMPO)
- Maricopa Association of Governments (MAG)*
- Pima Association of Governments (PAG)*
- Yuma Metropolitan Planning Organization (YMPO)

** Transportation Management Areas (TMAs)*

Arizona Councils of Governments

- Central Arizona Governments (CAG)
- Maricopa Association of Governments (MAG)
- Northern Arizona Council of Governments (NACOG)
- Pima Association of Governments (PAG)
- SouthEastern Arizona Governments Organization (SEAGO)
- Western Arizona Council of Governments (WACOG)

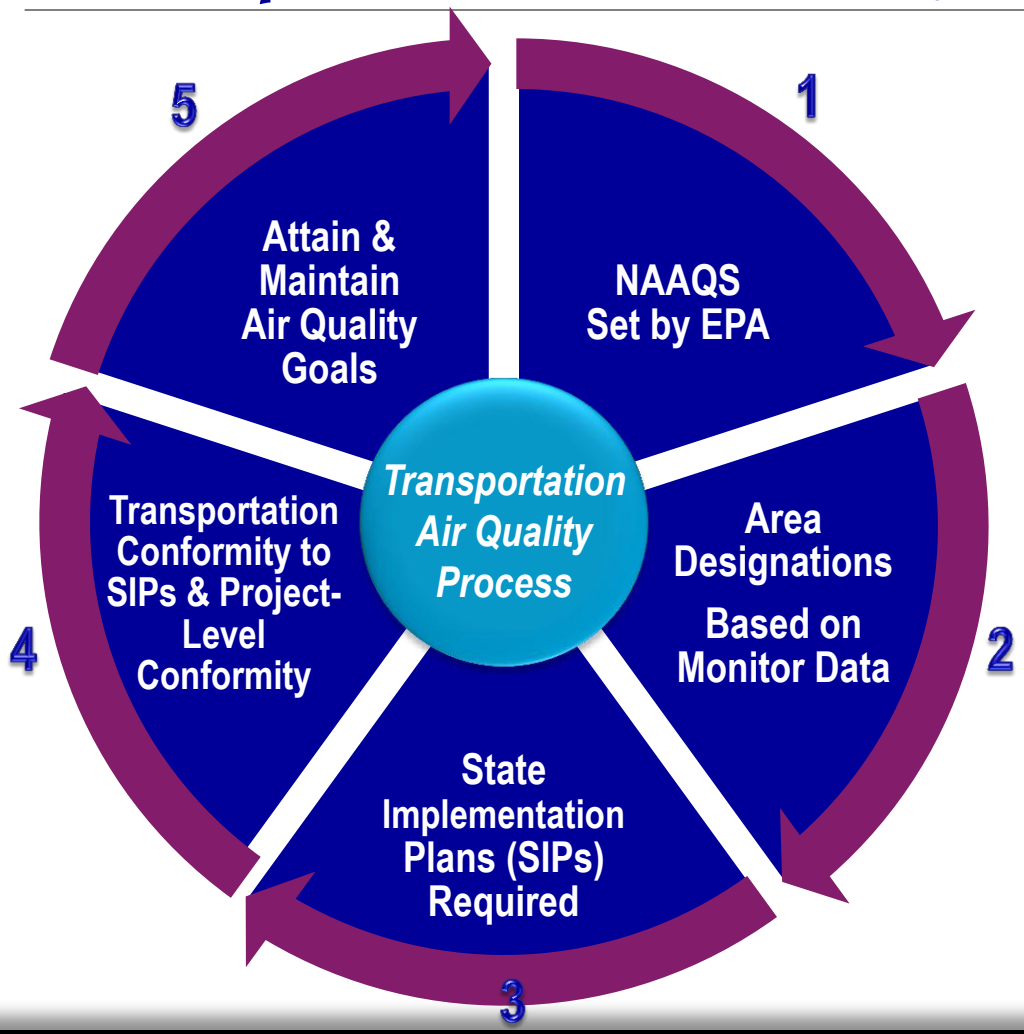
New Urban Areas (2010 Census)

- Casa Grande
- Lake Havasu
- Sierra Vista

Nonattainment or Maintenance Area(s) Located within Jurisdiction

Air Quality Overview

Transportation & Air Quality - Simplified



What's a NAAQS?

National Ambient Air Quality Standards required by the Clean Air Act and set by EPA for six criteria air pollutants:

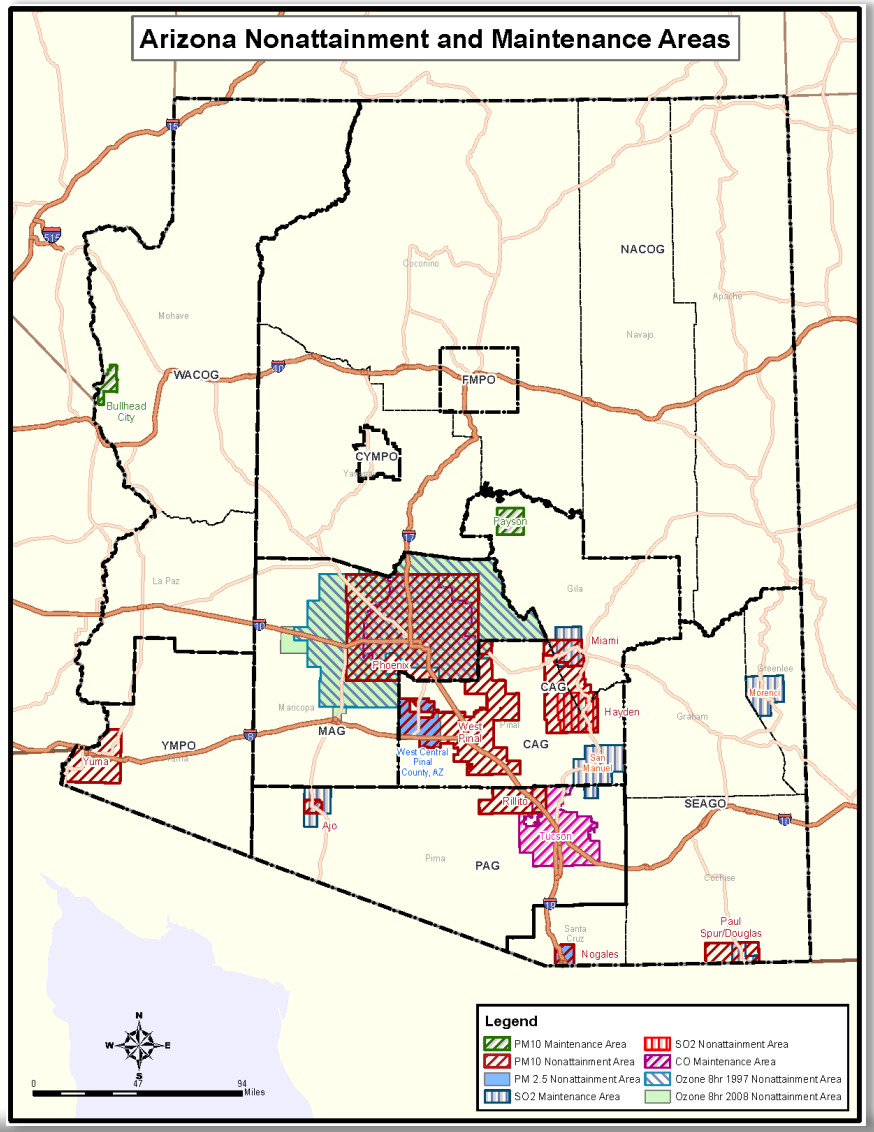
- Ozone O_3
- Sulfur Dioxide SO_2*
- Particulate Matter $PM_{2.5}$
- Particulate Matter PM_{10}
- Lead Pb*
- Nitrogen Dioxide NO_2
- Carbon Monoxide CO

** Pb and SO_2 areas not subject to transportation conformity requirements*

Air Quality Overview

Air Quality in Arizona

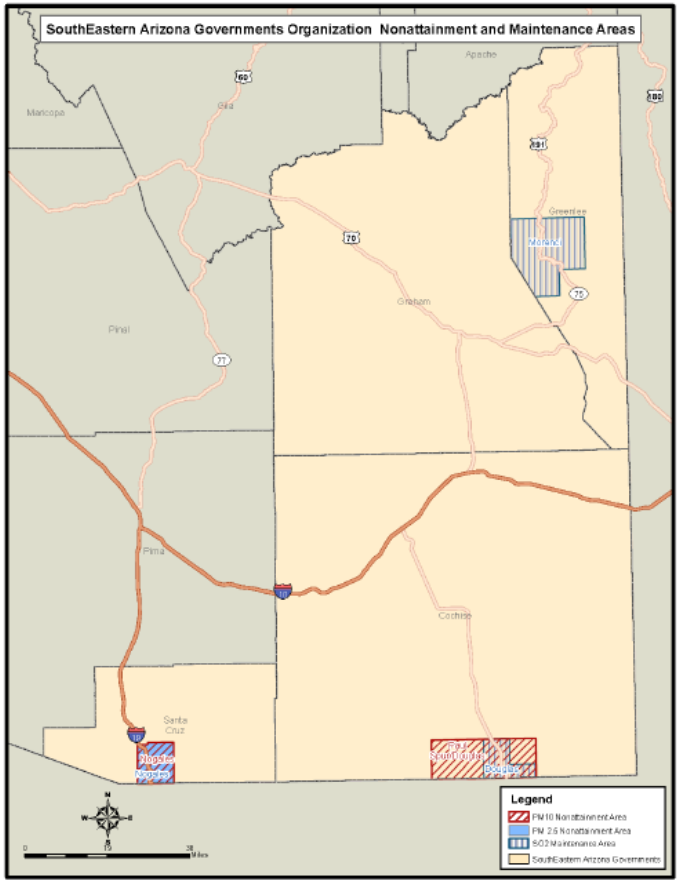
- Over 20 Nonattainment / Maintenance Areas
- 16 Areas Require Conformity
  - Regional (1)
  - Project-Level (3)
  - Both (12)



Air Quality Overview

What will be in the Guidebook?

- Overview of NAAQS
- Conformity Background
- Arizona Status
  - Nonattainment / Maintenance Areas
  - SIPs
  - MVEBs
- Other Resources



County	Current SIP Status[1]	Notes *(as of February 1, 2013)*
Nogales, AZ $PM_{2.5}$ Nonattainment Area		
Santa Cruz (P)	Attainment Finding Effective 2/6/2013 78 FR 887	Area remains nonattainment until a Maintenance Plan is submitted and approved. Regional conformity still applies.
Nogales, AZ PM_{10} Moderate Nonattainment Area		
Santa Cruz (P)	2012 SIP Approval Effective 10/25/2012 77 FR 58962	EPA approved the plan element demonstrating that the Nogales nonattainment area is attaining the NAAQS for PM10, but for international emissions sources in Nogales, Mexico.
Paul Spur/Douglas (Cochise County), AZ PM_{10} Moderate Nonattainment Area		
Cochise (P)	Attainment finding Effective 9/4/2012 77 FR 45965	Area remains nonattainment until a Maintenance Plan is submitted and approved. Maintenance Plan under development. Regional conformity still applies.

(P) = Partial

1. For information regarding Federal Register documentation related to motor vehicle emissions budgets (MVEBs) please see Table A1-1.

ADOT
Air Quality Management Guidebook

Interagency Consultation

Goal: Update and Streamline Existing Processes

Interagency Consultation
Arizona Participants

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Conformity Procedures

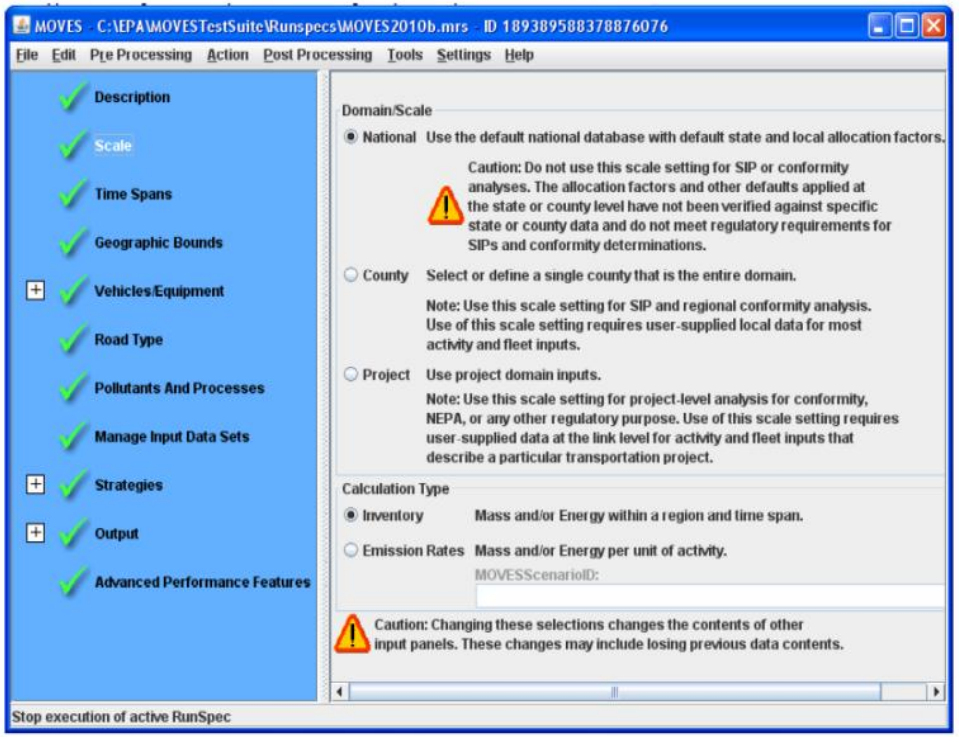
Goal: Document Existing ADOT Processes & Provide Recommendations for Updates

Purpose of Working Paper 3

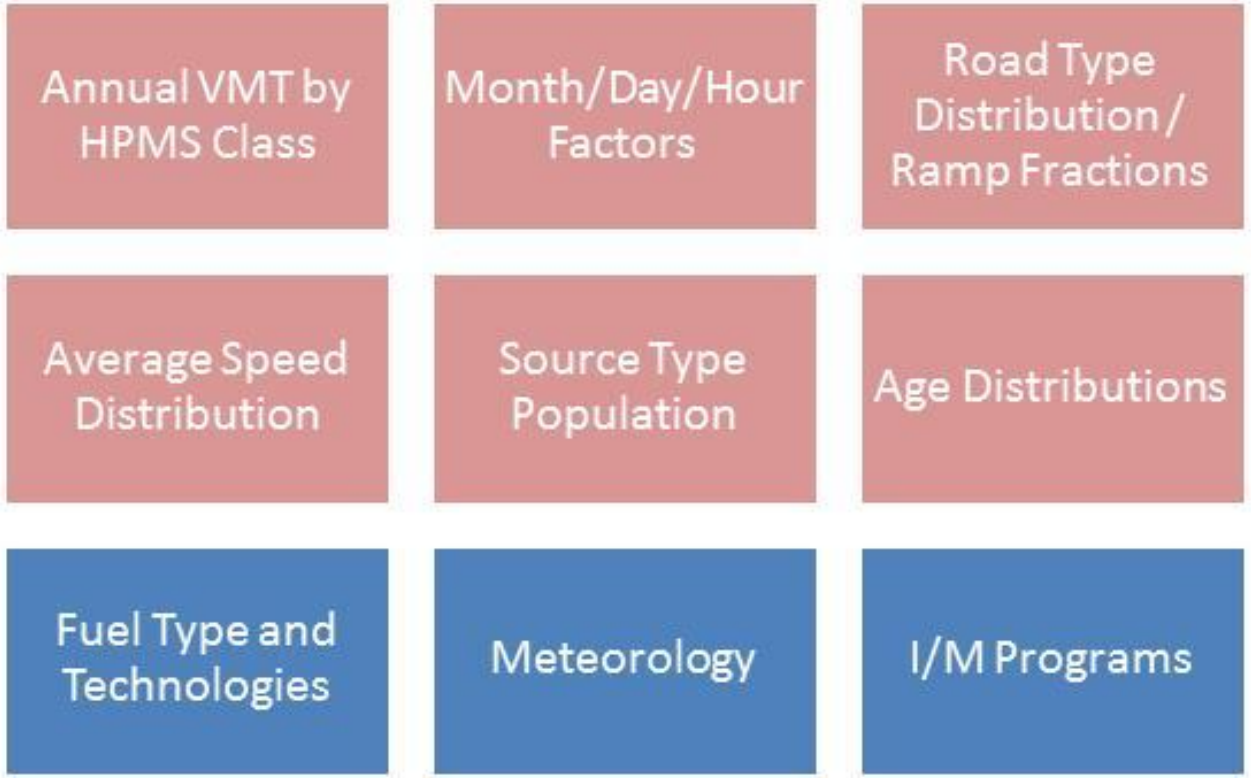
- Discuss key technical issues related to MOVES
- Assess past practices (Mobile6.2) and sample ADOT analyses using MOVES
- Work towards recommended approach and items to include in guidebook
  - ✓ Data Sources
  - ✓ MOVES Operation and Processing
  - ✓ MOVES Inputs
- Provide example PM hot-spot consultation

MOVES Model

- Key issues with MOVES integration
- Available EPA guidance by type of analysis



MOVES Input Data



Annual VMT

What are the available data sources? Roles?

Primary Data Source

- MPO Regional Model
- Statewide Model

➢ VMT by time period
➢ Vehicle type breakdown

Supplementary Data

- HPMS VMT Totals by County

➢ Missing local VMT
➢ Reconciliation (if necessary)

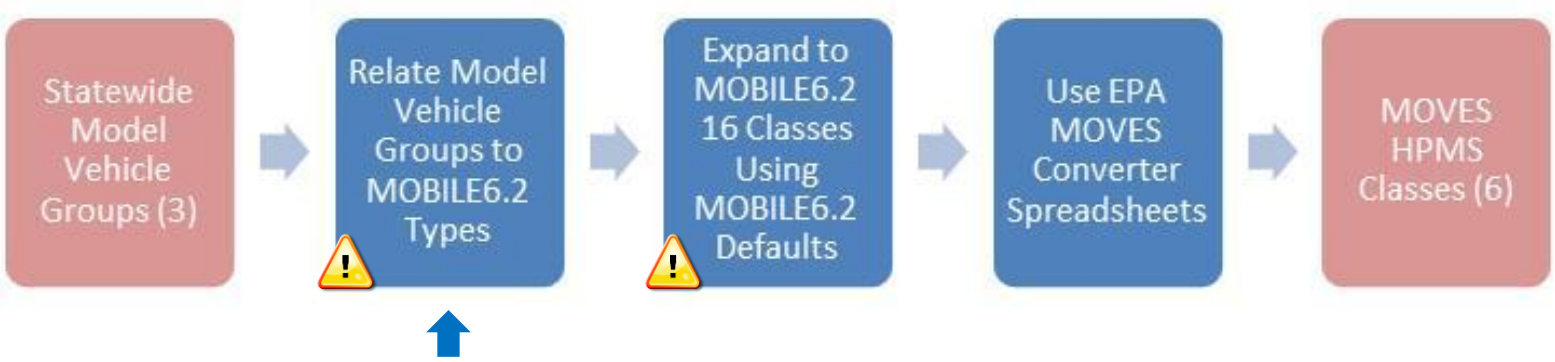
Other Support Data

- HPMS Source Traffic Database

➢ Model validation data

Annual VMT – By Vehicle Type

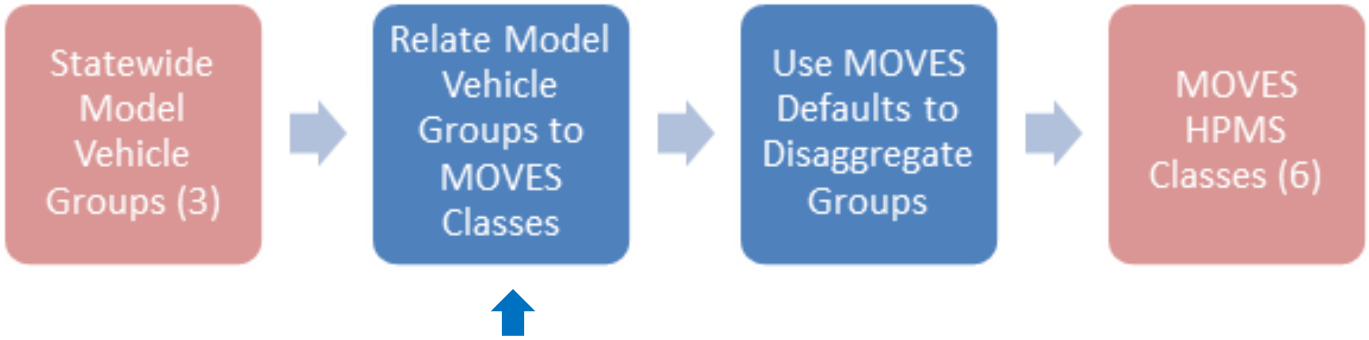
- **Sample ADOT Analyses**



Statewide Model	MOBILE6.2 Types
Auto	LDV
SUT	LDT1-4
MUT	HDV2-HDV8B
HDBS, HDBT (Assumed 0 for Pinal)	
MC (Used National Default)	

Annual VMT – By Vehicle Type

- **Recommended Method**



Statewide Model	MOVES Classes
Auto	Passenger Car
	Motorcycle
	(x%) of Light Trucks
	(x%) of Light Trucks
SUT	Single Unit Trucks
	Buses
MUT	Combination Trucks

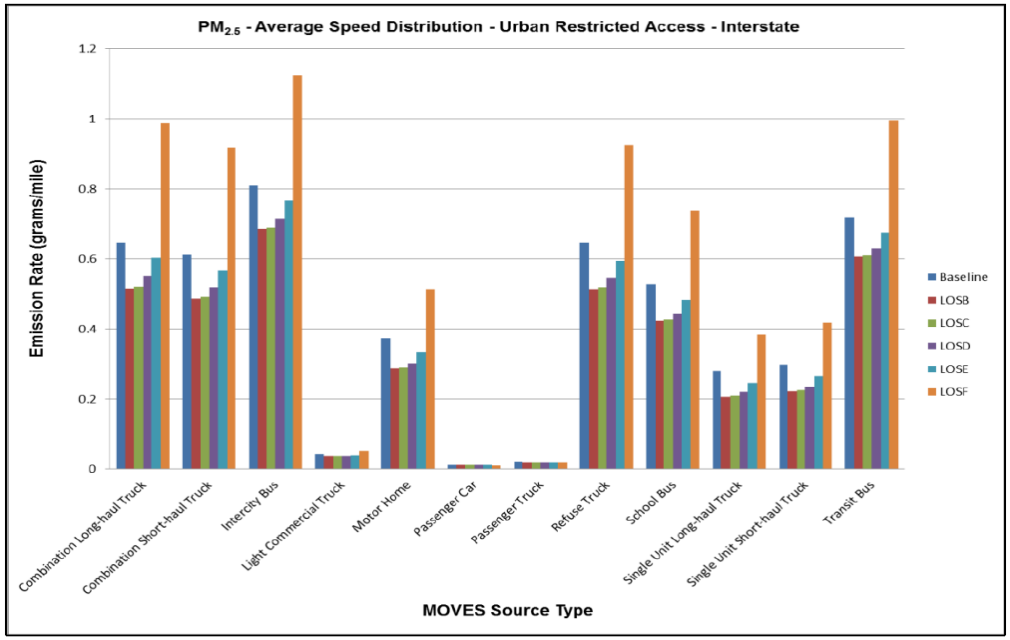
← Are other sources available?

Other VMT Disaggregation

- **Month/Day/Hour**
  - ✓ Evaluate if MOVES defaults representative of region
  - ✓ ADOT sample methods provide hourly fractions from statewide model
- **Road Type**
  - ✓ ADOT provides relationships between model facility groups to MOVES Road Type
- **Portion on Ramps**
  - ✓ Evaluate if MOVES defaults representative of region
  - ✓ If from model, fractions based on VHT not VMT

Travel Speed

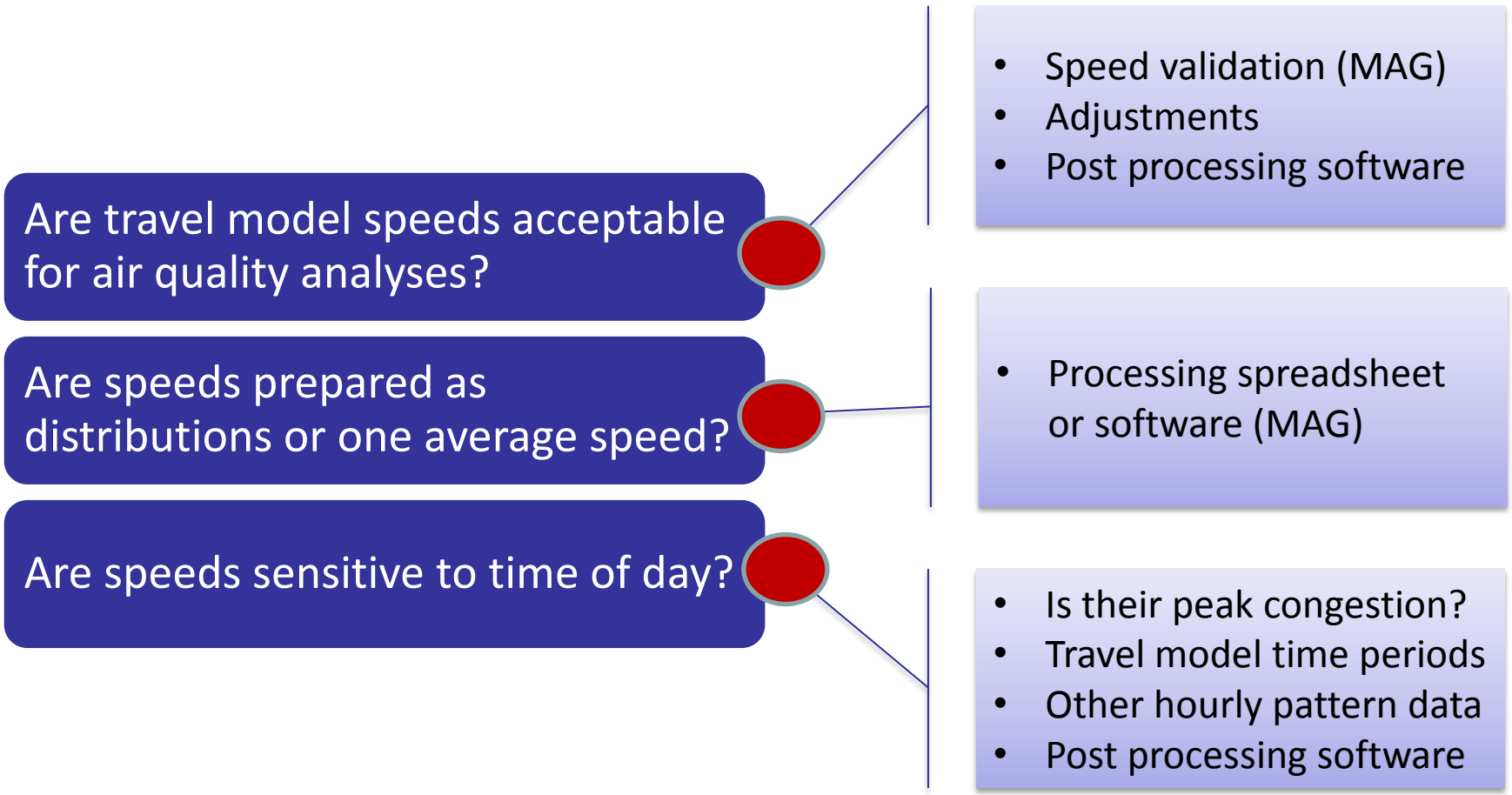
- In MOVES, emissions vary by speed
- In MOBILE6.2, PM not impacted by speed
- How can speeds be represented in MOVES?



Distribution of VHT to 16 Speed Bins by:

Road Type / Source Type / Hour of the Day

Travel Speed – Key Considerations



Assessing Preparation of MOVES Input Data

Vehicle Population

Population affects vehicle starts & evaporative emissions

Arizona Registration Data

- Are heavy trucks properly represented?
- Traffic from other counties

Convert to Mobile6.2 Categories

- Weight-based categories often have better correspondence to registration data

Use EPA Guidance for MOVES Conversion

Vehicle Population - Forecasting

- Must be forecasted
- Data sources to assist in determining growth rates:
  - ✓ VMT growth
  - ✓ Travel model trip data
  - ✓ Household / Population / Employment growth
  - ✓ Combination of above

Vehicle Ages

- Significant impact on emissions
- Based on registration data
- Similar issues as presented for Vehicle Population
- For Conformity/SIP modeling, ages cannot be forecasted to be newer than present year
- Important consideration when developing motor vehicle emission budgets

Other Data Issues

- Temps/humidity consistent with SIP
- Hourly temps required
- Default MOVES fuel data must be reviewed
- Forecast fuel types
- Default MOVES I/M data must be reviewed

Key Issues in Running MOVES

Batch Processing

- Ease of use - QA/QC
- Efficiency
- Linkage of pre / post processing programs

Pre-Post Processing

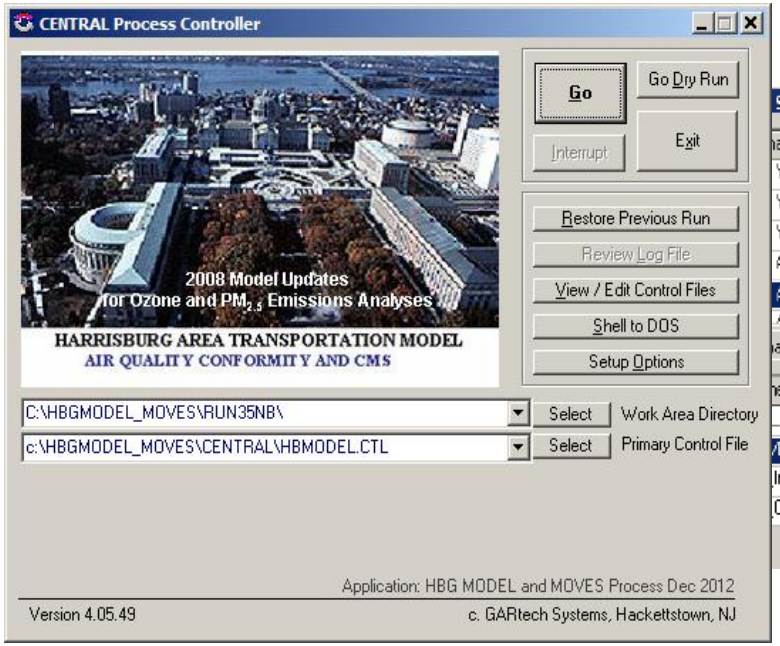
- Prepare MOVES inputs (e.g. VMT, Speed)
- Post process model speeds/VMT
- Apply MOVES rates (if necessary)

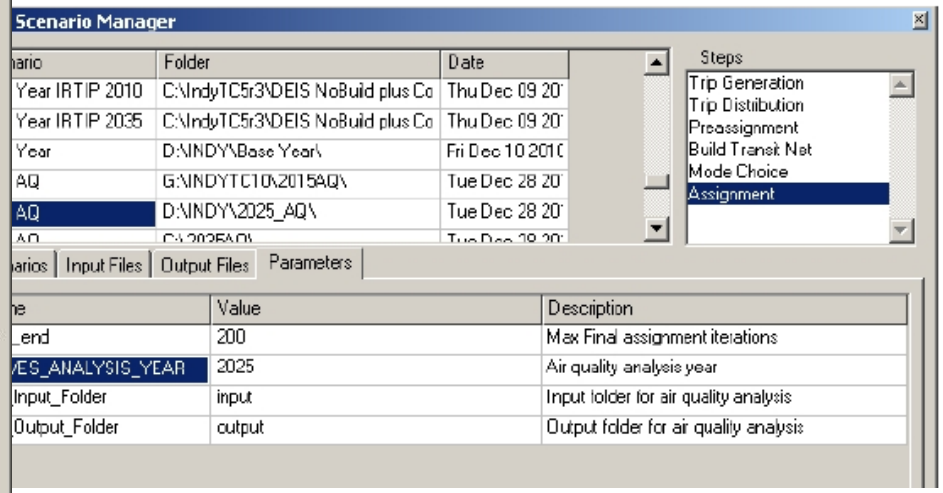
Inventory vs. Rate

- Affects post processing
- Detail of emissions

Batch / Post Processing - Methods

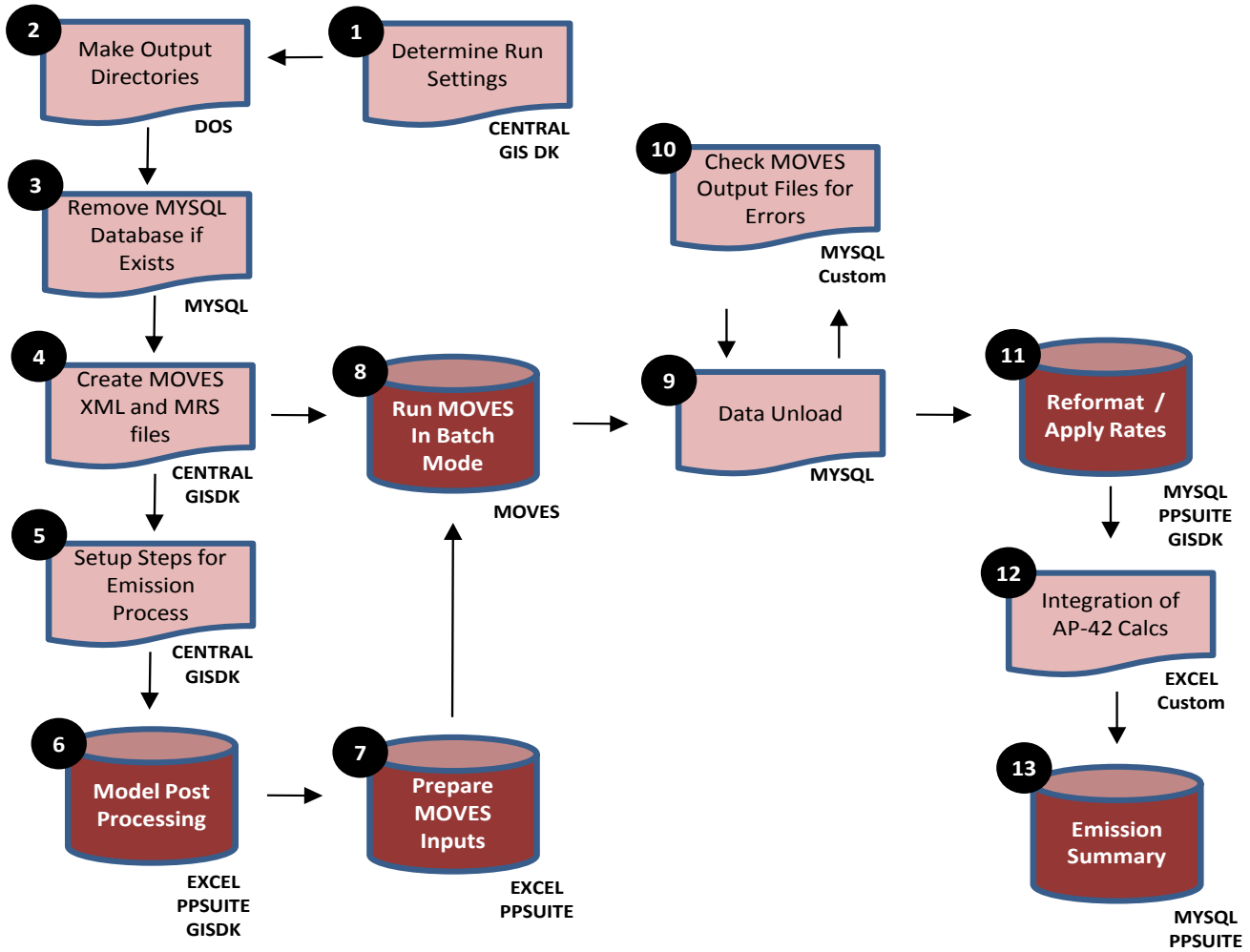
- Off-the shelf software (M6Link, Central, PPSUITE)
- Customized routines / programs (GISDK)
- EXCEL Spreadsheets



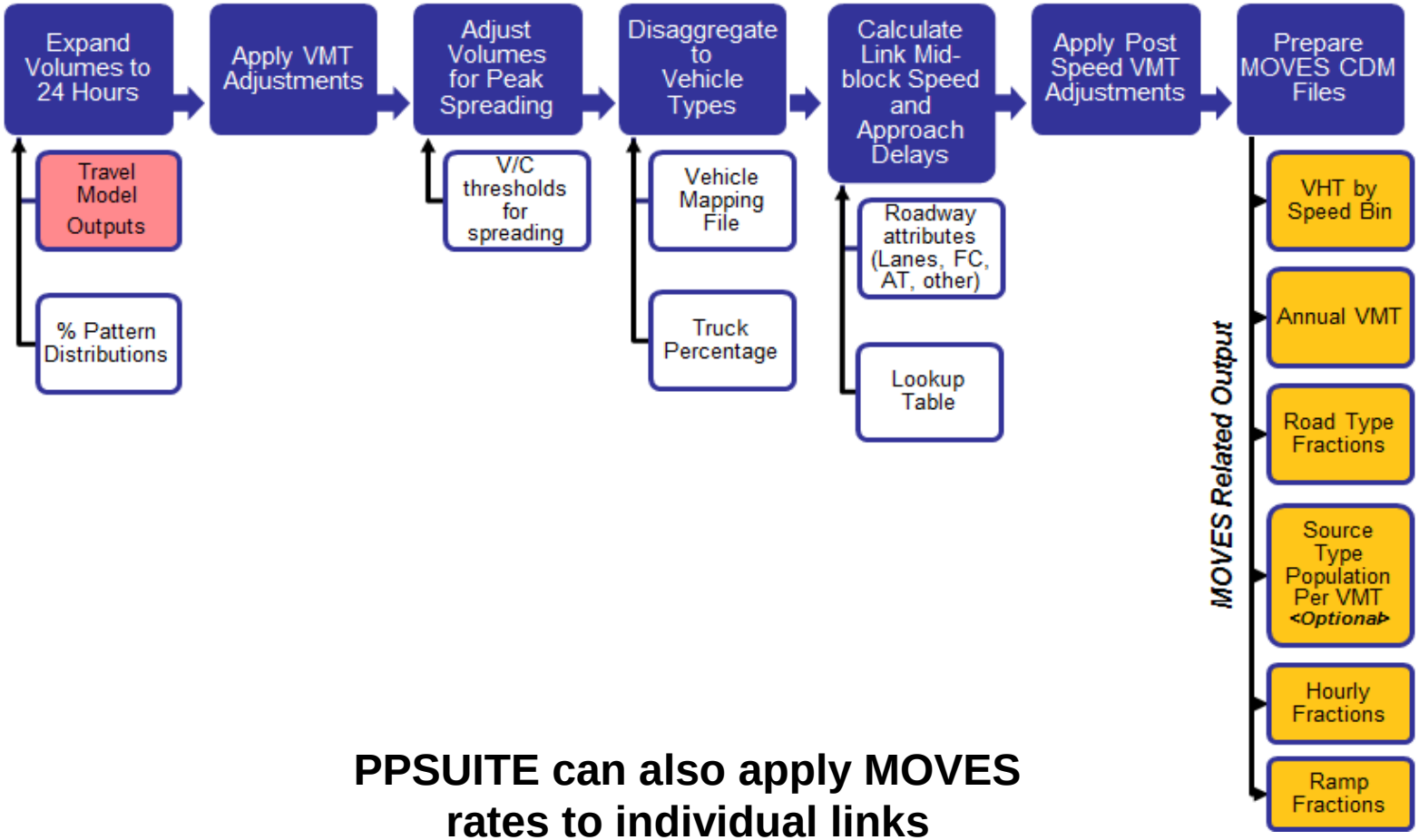


Running MOVES

Batch Processing - Example



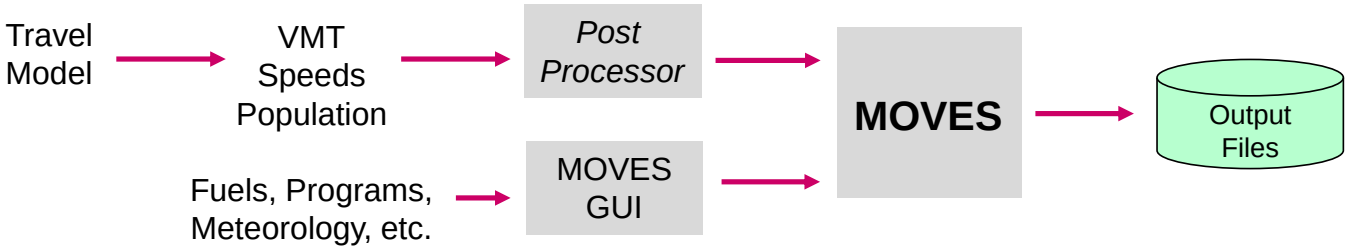
MOVES Pre/Post Processor- PPSUITE



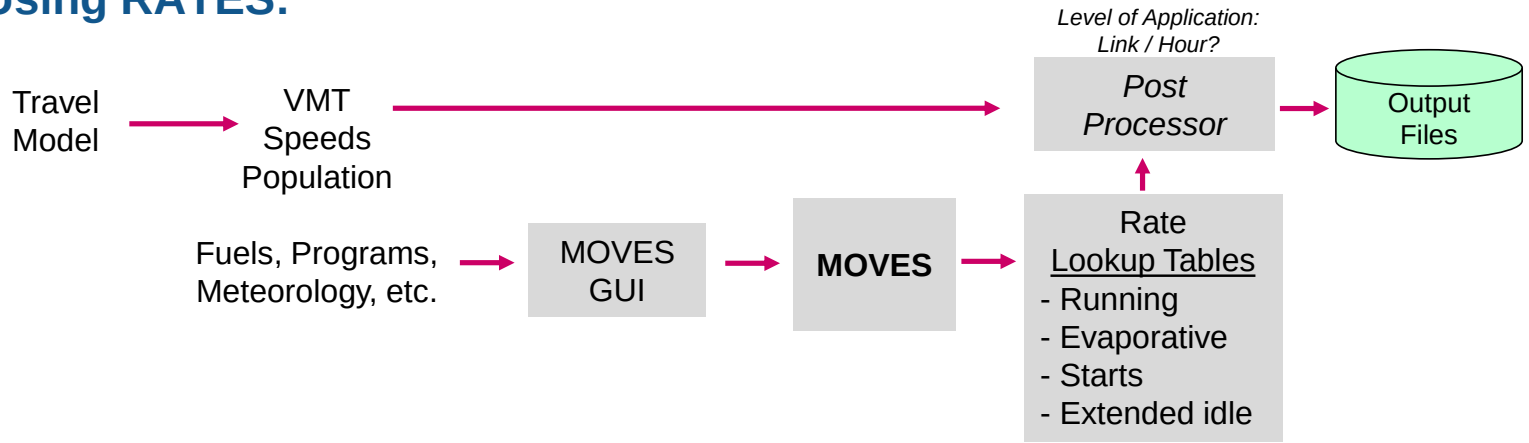
PPSUITE can also apply MOVES rates to individual links

Inventory vs. Rate Method

Using INVENTORY:



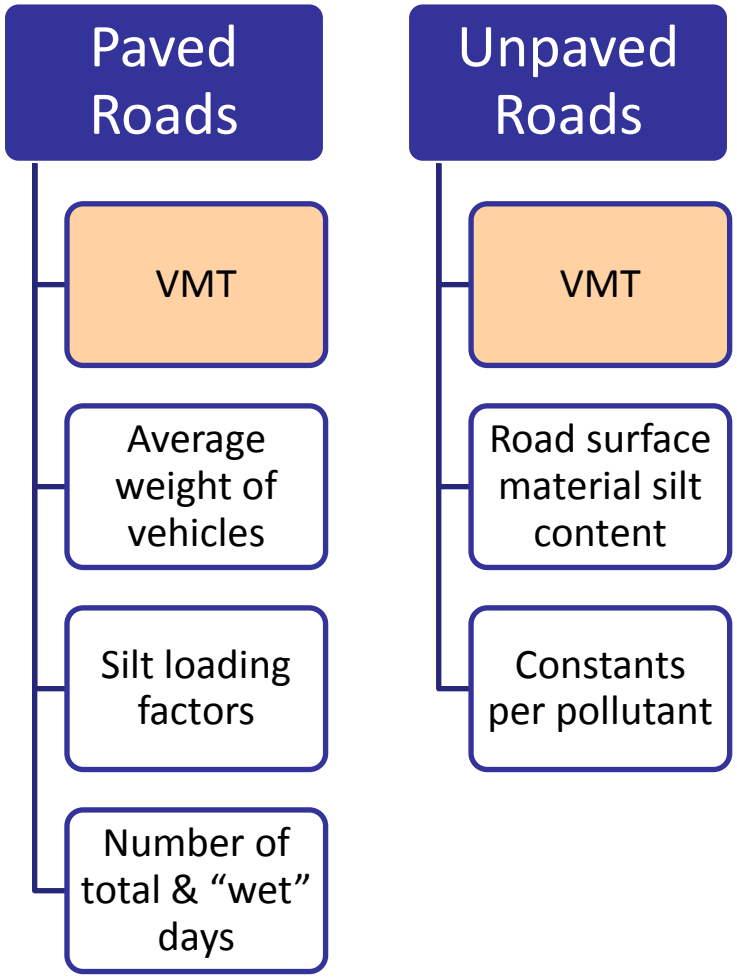
Using RATES:



Re-Entrained Road Dust

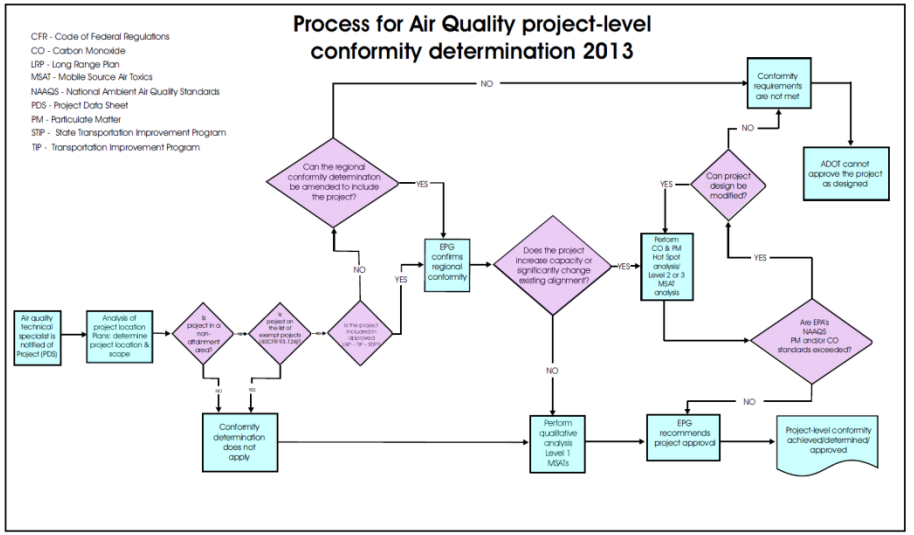
- Road dust is significant component of PM_{10} mobile source inventories
- MOVES does not estimate
- Use equations found in AP-42 Chapter 13
  - ✓ EPA document
  - ✓ Compilation of emission factor information
  - ✓ Empirical equations

Using AP-42 Equations (Data Needed)



Project-Level Procedures

PM Hot-Spot Requirements



- **Areas of Focus**
  - Projects requiring a quantitative analysis
  - Technical analysis procedures
- **Other State Efforts**
  - Limit projects requiring PM hotspot analyses
  - Limit interagency consultation to a small # of projects

Example of PA's Screening Process

Screening Level	Criteria Based On	Who Makes Decision?	What Data is Used?
LEVEL 1 Is the project exempt or does the project fall in an area that requires analysis?	Final Rule and EPA/FHWA guidance	PennDOT	Maps of nonattainment and maintenance areas and/or Exempt project table.
LEVEL 2 Is the project clearly not of air quality (AQ) concern?	Above plus agreed upon thresholds (Level 2 Flowchart)	PennDOT	Project traffic data, Base year traffic maps, and/or Intermodal facility information.
LEVEL 3 Does the project require more substantial review to determine if it is of AQ concern?	Above plus ICG review of project	ICG*	Project traffic data, Base-year traffic maps, and/or Intermodal facility information. May be supplemented by additional information.

Key Consultation if Analysis Needed

ICG Decisions On:	Analysis Approach
	Study Area
	Analysis Years
	Type of PM Emissions Analyzed
	Emission Models
	Background Concentrations
	Traffic Data Sources / MOVES Application Methods
	Receptor Locations
	Other Input Parameters

What Goes into the Guidebook?

- There are recommendations / considerations that can be stressed in preparing MOVES inputs
  - ✓ Complement EPA guidance
  - ✓ Alternatives for technical robustness
- Batch processing / Post Processing
  - ✓ Will depend on each area's tools and resources
  - ✓ Flexibility – there are alternative methods for MOVES application
- PM Hot-Spot Screening
  - ✓ Process options / input from federal partners

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Air Quality Management Guidebook

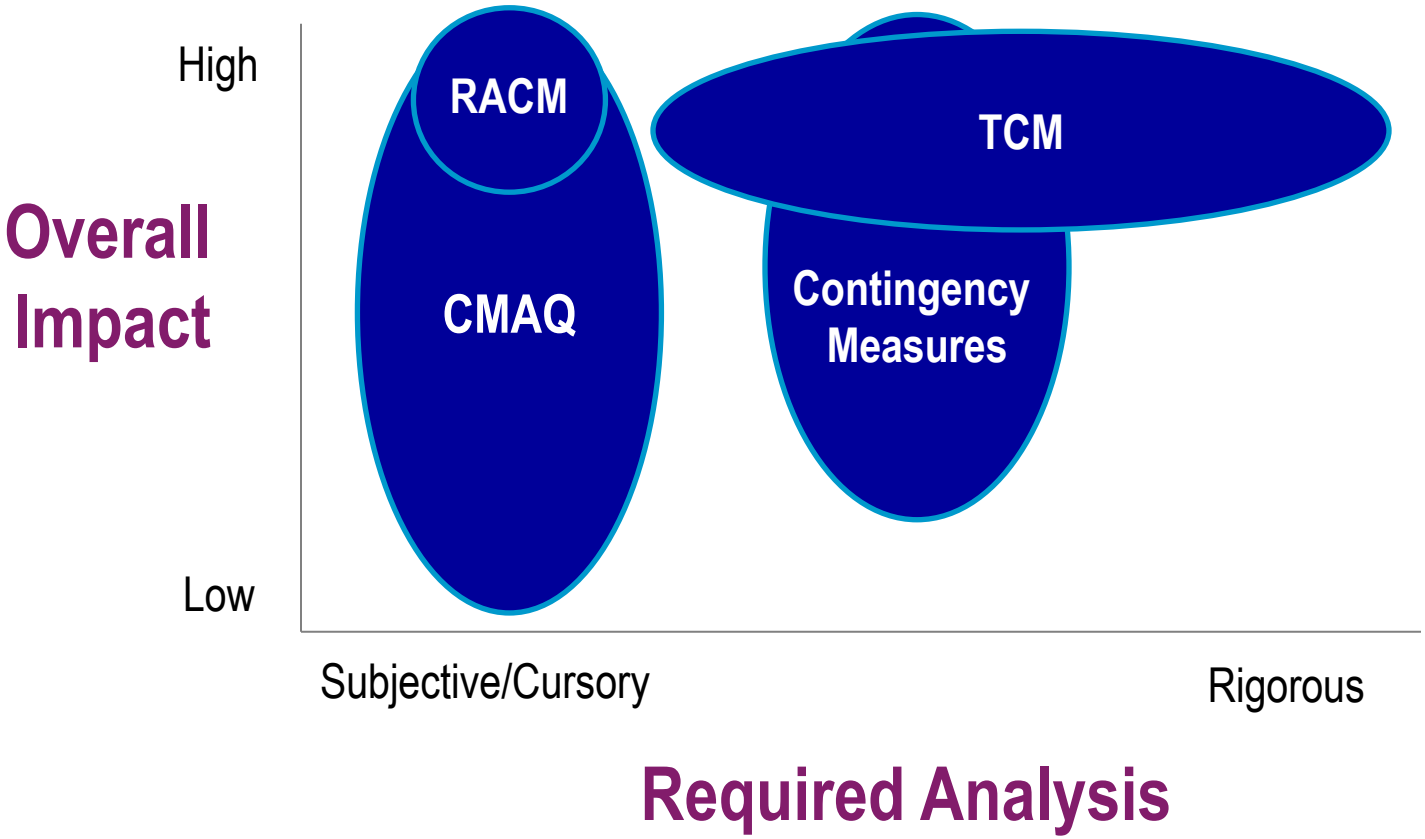
Mitigation Measures and Transportation Control Measures

Goal: Document Existing ADOT Processes & Provide Recommendations for Updates

Development of Mitigation Measures and Transportation Control Measures

- What is a TCM?
- Assessment of Current Methodologies
- Research and Development
  - Project Types
  - Methodology Development
- Recommendations

Mitigation and Transportation Control Measures
Are they all TCMs?



Mitigation and Transportation Control Measures
Assessment of Current Methodologies

- Arizona is Unique
- Documented Approaches and Analyses in Arizona (SIPs, CMAQ, Others?)
- Work to Date
  - Review Existing Documents
  - Review of Other States
  - Initial project selection

Mitigation and Transportation Control Measures
Assessment of Current Methodologies

Completed

- Assembled project types and methods from ADOT/MAG
- Removed MAG specific values/adjustments
- Checked against AP-42 methods

In Progress

- MOVES emission rates in examples (County)
- Accompanying spreadsheet

Mitigation and Transportation Control Measures

Project Types – PM_{10} and $PM_{2.5}$

Dust Mitigation projects build on existing ADOT work:

- Unpaved Road Treatments
- Unpaved Road Improvements
- Road/Alleyway Paving
- Paving Shoulder/Gutter/Curb
- Paving Bicycle Trails
- "Certified" Sweepers

Mitigation and Transportation Control Measures

Project Types – PM_{10} and $PM_{2.5}$

Dust Mitigation projects build on existing ADOT work:

- **Methodologies are largely from ADEQ/MAG/Nogales CMAQ**
- **$PM_{2.5}$ will be set percentage of PM_{10} reductions (25% - but open to suggestions)**
- **Certified Sweepers are special due to fuel only**

Mitigation and Transportation Control Measures
Project Types – PM_{10} and $PM_{2.5}$

Non-Road Retrofits:

- Certification dictates reduction credit
- CA certified retrofits are PM only
- Likely are Ozone related benefits
- 2008 Tier 3 was enacted: fewer upgrade opportunities
- Apply certified reductions to NONROAD emission rates

Mitigation and Transportation Control Measures

Project Types – PM_{10} and $PM_{2.5}$

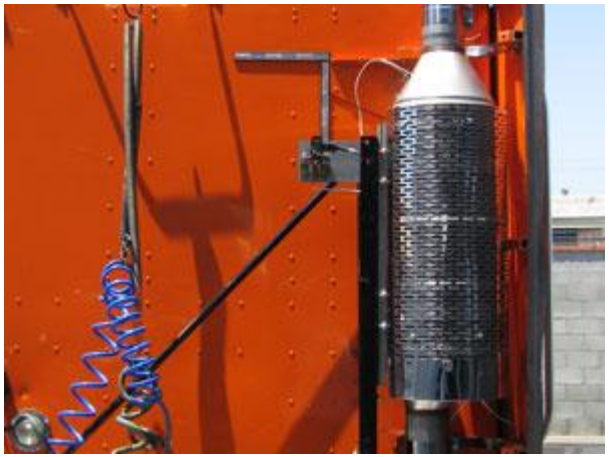
Construction related emissions:

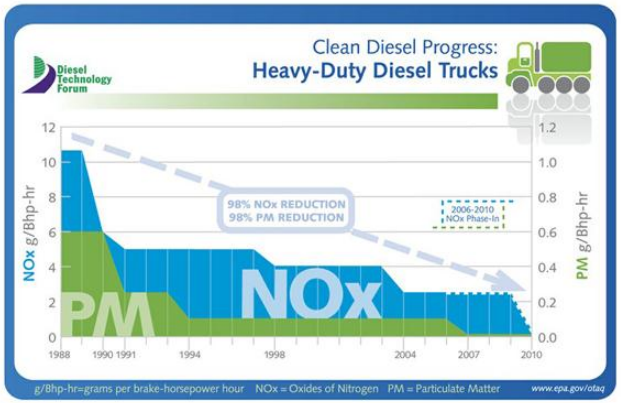
- Use 2009 ADOT study is one option (activity data)
- Vehicle emissions can be looked at using NMIN or NONROAD derived rates + certified retrofit reductions + assumptions on use if no activity data available

Mitigation and Transportation Control Measures
Project Types – PM_{10} and $PM_{2.5}$

On-road retrofits:

- Opportunities are dwindling
- ADOT existing approach is appropriate
- Emission Factors need to be updated using MOVES
- Use EPA Retrofit Calculator if feasible





Mitigation and Transportation Control Measures
Project Types – All Pollutants

Truck stop anti-idling:

- Use local usage data or 10 hour/day/space assumption (conservative)
- Need to develop MOVES emission rates

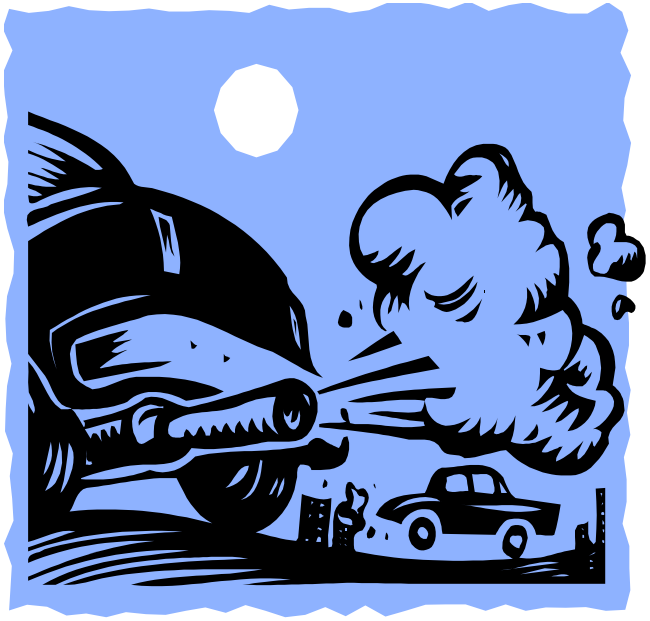
Regional anti-idle regulations:

- Methodology unavailable

Mitigation and Transportation Control Measures
Project Types – All Pollutants

Expanded/Enhanced I/M:

- High impact
- Limited Opportunities
- Best addressed when developing baseline MVEB (previous section)



Mitigation and Transportation Control Measures
Project Types – All Pollutants

Trip Reduction Measures

- **MAG CMAQ methods appropriate for most**
  - ✓ Bike/Ped
  - ✓ Transit
  - ✓ Park and Ride
- **Trip Reduction Programs/Measures**
  - ✓ Approach is optimistic

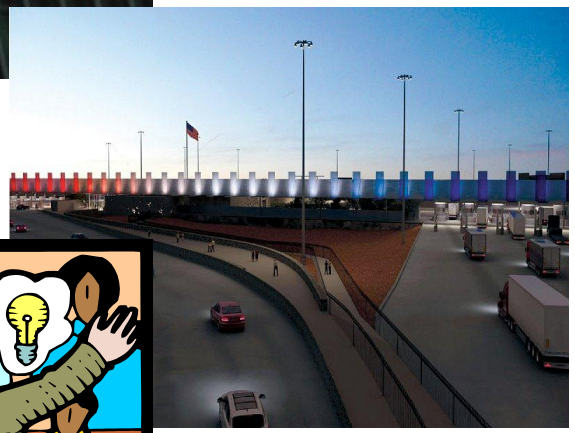
Mitigation and Transportation Control Measures
Project Types – All Pollutants

Traffic Signal Coordination

- Evolving
- No guidance
- Sample intersection

Land Ports of Entry

- USVISIT studies may be available



Anything missing?

ADOT
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Feedback & Contact Info.

Feedback

Tell us what you think.

- Comments
- Questions
- Resources
- Documents:
  - http://www.azdot.gov/mpd/air_quality/projects.asp

Contacts

Keep us in the loop.

ADOT

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